

Dairy Herd Health & Management

Separated Manure Solids for Freestall Bedding

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Introduction

Mastitis is one of the costliest diseases for the U.S. Dairy Industry, and management decisions that may affect mastitis risk are considered carefully. One such decision is the choice of a bedding substrate that helps keep cows clean and comfortable. Maintaining good udder hygiene does reduce mastitis risk. Several bedding options are available, and each has advantages and disadvantages. Separated manure solids (SMS) have been used as a dairy cow bedding substrate for many years. Some farms have used SMS successfully, meaning the transition to manure solids bedding did not increase mastitis and/or reduce milk quality. Other herds experienced increased mastitis around the time they switched to manure solids, and attributed this to bedding. Much research has been done to help the industry understand best management practices for use of this organic bedding substrate, but consensus still lacks on if and how SMS should be used.

The specific objective of this project was to analyze the records of collaborating farms specific to their management of manure solids as a bedding material. The five farms that participated in this study represent a variety of SMS management systems in New York.

The study analyzed:

- Quantitative bacterial culture and dry matter assessment of fresh and used bedding
- Qualitative teat skin surface cultures taken prior to and immediately following pre-milking preparation

- Barn temperature and humidity
- Herd milk quality data
 - Clinical mastitis risk
 - Subclinical mastitis risk
 - Mastitis related culling risk
 - Other herd data potentially influencing milk quality data
- Udder hygiene scoring
- Teat end hyperkeratosis scoring

Chart 1: SMS Bedding Cultures - Median Total Bacteria Count (Total Coliforms, Strep spp, Staph spp.)

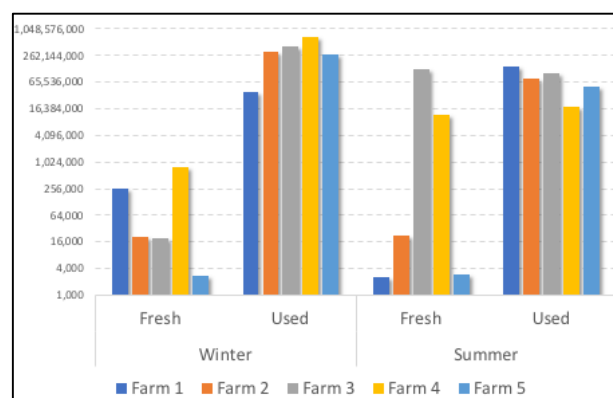


Table 1: SMS Bedding Moisture Content

Farm #	1	2	3	4	5
Fresh SMS [Winter]	59.6%	66.8%	60.7%	60.2%	55.9%
Used SMS [Winter]	38.8%	53.4%	59.5%	46.9%	47.9%
Fresh SMS [Summer]	59.2%	68.3%	65.0%	54.1%	51.8%
Used SMS [Summer]	35.7%	39.7%	44.8%	34.4%	33.5%

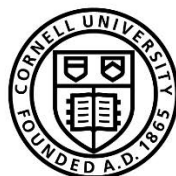


Table 2: Teat Skin Culture Results

Farm #	1	2	3	4	5
% Pre-Prep Teat Skin E. coli positive [Winter]	11%	0%	44%	22%	0%
% Pre-Prep Teat Skin Klebsiella positive [Winter]	0%	13%	11%	33%	0%
% Pre-Prep Teat Skin E. coli positive [Summer]	11%	11%	0%	13%	10%
% Pre-Prep Teat Skin Klebsiella positive [Summer]	0%	11%	11%	0%	20%
Milking Prep Failure [Winter]	47%	63%	29%	74%	72%
Milking Prep Failure [Summer]	21%	47%	17%	35%	50%

Table 3: Udder Hygiene & Teat End Scores

Farm #	1	2	3	4	5
% Udder Hygiene Score 3 or 4 [Winter]	12%	15%	16%	14%	9%
% Udder Hygiene Score 3 or 4 [Summer]	5%	3%	21%	27%	11%
% Teat End Score Rough or Very Rough [Winter]	19%	18%	29%	19%	10%
% Teat End Score Rough or Very Rough [Summer]	9%	8%	1%	20%	5%

Table 4: Farm Milk Quality Data

Farm #		1	2	3	4	5
Monthly Clinical Mastitis	Winter '16	3.4%	6.1%	2.3%	8.3%	4.1%
	Summer '16	1.4%	5.3%	2.3%	5.4%	2.1%
New Infection Subclinical Mastitis	Winter '16	n/a	8%	7%	7%	6%
	Summer '16	n/a	4%	7%	8%	8%

Results

Risk of mastitis to dairy cows is multi-factorial, with udder hygiene representing a significant proportion of that risk. Regardless of methods used to generate SMS, all used bedding cultures taken from the cow stalls had similarly high bacteria counts. Milk quality parameters varied across the five farms. Mastitis risk reduction investments in other areas, like milk parlor maintenance, optimizing milking routines, and general herd health may be better than investing in ways to reduce bacterial counts in SMS.

SMS can be used successfully as a stall bedding source if it results in good cow comfort and causes no decline in cow health, including mastitis.

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